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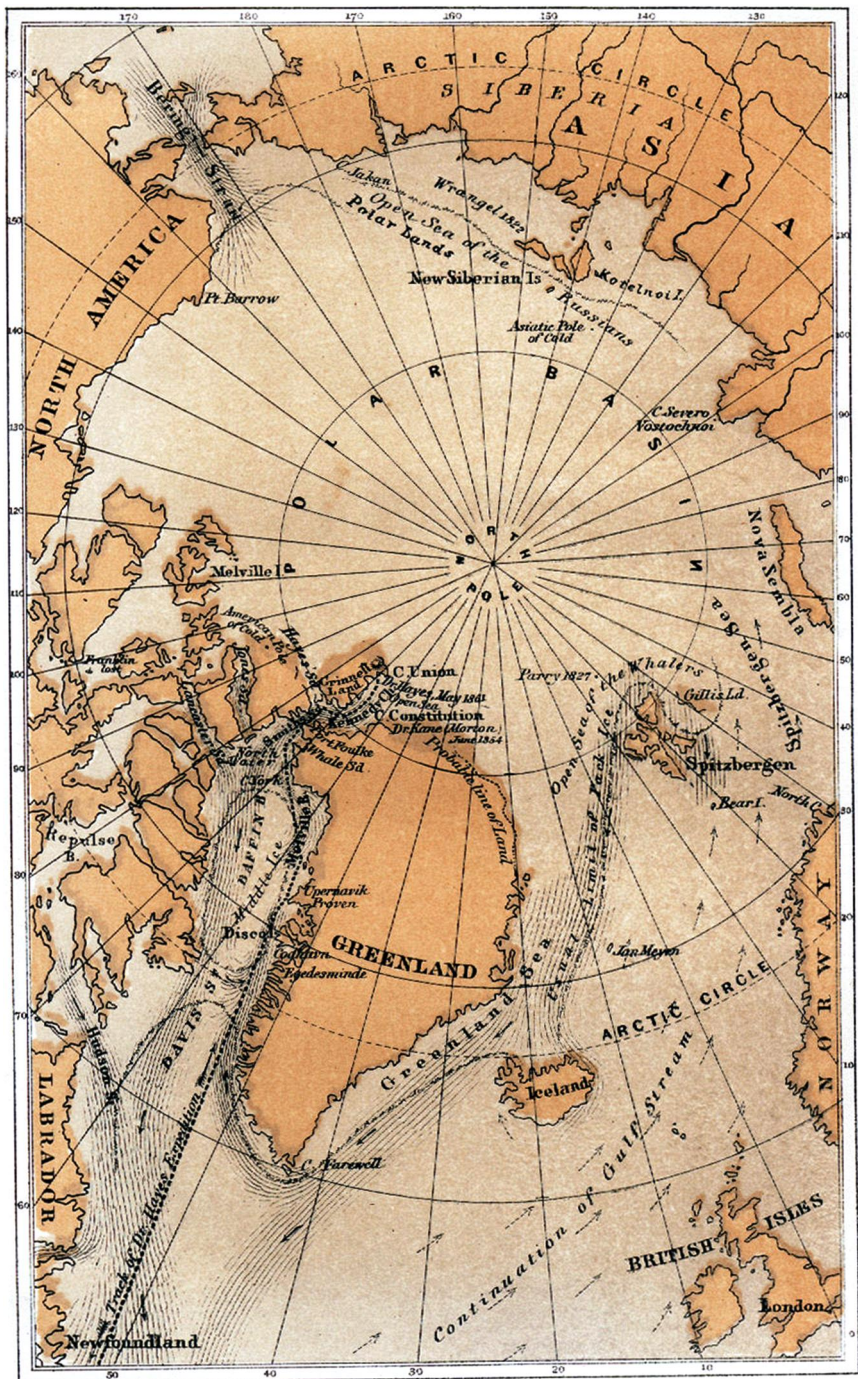
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JOURNAL OF THE AMERICAN GEOGRAPHICAL AND STATISTICAL SOCIETY.

I.—*Address on Arctic Exploration.* By Dr. I. I. HAYES.

Delivered November 12, 1868.

Mr. President: Gentlemen of the Geographical Society:

I BELIEVE I owe my invitation to address you and the ladies who kindly grace our meetings, to the circumstance that the German and Swedish expeditions of the past summer have awakened a slumbering interest in the progress of Arctic discovery.

Although I have for several years been more or less identified with this subject, it is, perhaps, not inappropriate for me to observe at the outset, that I do not propose to address you as one having a cause to advocate or a theory to prove; but rather as a member of a scientific society which has assumed to itself the charge of important interests, and to which the public naturally look for instruction upon those matters with which we are concerned. For our science is essentially a popular one. We have all of us constant occasion to refer to its earliest as well as to its latest records. It is derived from many sources. In some sense it might be said to cover almost the entire field of human knowledge. As Malte-Brun has well observed, it is a "living picture of the Universe," rather than, as it is too often considered, a mere enumeration of the various rivers, mountain chains, and countries, with their respective lengths and heights and populations—pedantic dryness, which has not failed to make geography the least pleasing where it should be the most attractive of studies.

Geography might indeed be likened to an unfolding scroll, ever fresh with novelties to please the mind and delight the fancy. We read there the general progress of all the sciences and of the arts; of the influence of religion upon communities

of men, and of schemes for their advancement; of everything, indeed, which concerns human history; of barbarous peoples brought within the pale of civilization, of new lands for enterprising men, new products for the lap of commerce.

The subject is indeed so comprehensive in its nature, that I feel tempted to approach my own immediate theme through its pleasant atmosphere. And this is not inappropriate. One half the value, and all the living interest, is lost by the study of geography mathematically; that is to say, by the study of any part of the globe without reference to the links which connect the local history with the general progress of geographical knowledge. Like some great river discharging to the sea through a wide-spreading delta, the intricacies of which can only be fully comprehended by approaching from above; or like a human life, whose written history cannot have value unless the biographer has mastered the key—the secret motives to its successes and defeats, its sorrows and its joys; so if we would properly study a particular department of geography, we must learn the causes which led to the present state of our information.

Pardon so trite an argument, but it is sometimes necessary to assert a truism before we can illustrate a proposition.

Going back into antiquity we have two of the most ancient nations of the earth pictured to us in the writings of Moses and Homer. These were the first of geographers. Thus at least we should style them if we apply the term to descriptions of people and the places they inhabit. If the human laws of the one were divine, and the sublime poetry of both an inspiration, their simple statements are but an intellectual appreciation of what they saw, and what they knew. And what they have told us is indelibly fixed upon our minds. We know the customs of their respective peoples, and the character of their respective countries; we know the nature of the hills, mountains, plains, and rivers, the valleys and the fields of grain. With the one we wander by the tents of the captive tribes, with the other we overlook beleaguered Troy. We gaze wonderingly at the silvered summit of Olympus, we stand reverently at the foot of Sinai, and, by the fountains of the Euphrates, we linger in the cradle of the human race.

Thus geography began. Then Herodotus, "the father of history," the Strabos, the Plinys, the Ptolemys, follow with descriptions of the world as unfolded by the bold Phœnician sailors, who, guided only by the stars, threaded their way along the Mediterranean to the Atlantic Ocean; by the ad-

venturous voyage of Pytheas the Greek mariner and trader of Massilia, who first brought the west into view, and created conjectures respecting the north; by the vast colonial system of Carthage; by the light which flashed up from the East above the military glory of Alexander; and by the gathering at length of all these discoveries and conquests beneath the sceptre of the Roman Cæsars.

And this was the then world; how small a part of it the Romans only knew when savage hordes from vast regions of which they had not even dreamed, swallowed up their empire, and left the monuments of their civilization—their temples, their colosseums, the arches of their triumphs—but a waste of smouldering ruins.

Here ancient Geography ends, and darkness worse than Polar night weighed down the human mind for centuries, until Phoenix like it rose again from its own ashes.

Modern Europe came into being with this new birth of intelligence. There was now another world, vaster than that of Rome. Modern Geography took its rise. The spirit of travelling was revived. That spirit had already in the dark ages guided the Arabs to the Moluccas, and the Scandinavians to Iceland, Greenland, and even to America; but no science accompanied these adventurous people to gather the fruits of their bold undertakings.

The Italians, Spaniards, and Portuguese take the lead in the new day which is dawning—in this new period of intellectual energy which followed the dark ages as a health-giving air comes with fresh breezes from the sea, lifting the death-dealing miasma that breeds within the pestilential swamp.

These men traverse the high seas with confidence. Possessed now of an unerring pilot, they grow fearless. From the bowels of the earth has come a dark, grayish-brown metallic ore, which is to work a mighty revolution. First found near Lydia in the province of Magnesia (whence its name), as *ferrum vivum*, it was known to the ancients, and was a familiar toy to Aristotle and Pliny.

They knew not the treasure they possessed. They knew not that its tenderest touch transformed a piece of steel, and fixed it in the meridian of the earth. They knew not that within their hands, as "paper weights," perhaps, upon their parchment-strewn tables, lay a silent force that was in time to sweep away their Hesperian gardens, and whose influence would reach beyond the dark *Thule* of their imagining—beyond the barrier of the North that was neither air, earth, nor water; be-

yond the great Morass of the West, made by the sinking of the Island of Atlantis; beyond the fiery regions of the South, where everything was melted or broke out in flame—to seas and lands indeed beneath their very feet, even to the fulfilment of the prophecy of the poet Seneca:—"Ages shall come in which Oceanus may unloose the bonds of things, and a vast land may be exposed, and Typhis may discover new worlds; and there may no longer be an *ultima thule* on earth." They little knew that this "quick-stone" would cause ships to come and go upon all the waters of the earth,—steering their course along the trackless highway with as much ease and certainty as they then navigated from one headland to another.

Yet this was soon to be. The magnetic needle giving confidence, the ship's prow is turned from the land. De Gama stands out boldly to the South from the Cape de Verde Islands, and finally passes the Southern Cape of Africa; Andreada, following upon his track, reaches China; and Columbus, inspired by conviction, and guided by the same silent and mysterious monitor, conducts to a new world.

Thus from opposite directions has Europe caught glimpses of the wondrous East, from the trade of which, by the old land channels, all Christian peoples had been shut out by the letter of Pope Nicholas IV., in the year 1291, forbidding traffic with the heathen. But now to their very doors has come upon the watery highway the land of spices and of pearls—the Ophir whence the Phœnician traders fetched the rich treasures to King Solomon; whence Lucullus drew the splendors that adorned his banquets; whose marvellous legends inspired the zeal of the Macedonian conqueror, and were now to inspire other bold men to deeds of equal daring—to send Cortez to Mexico, the Pizarros to Peru, De Soto to the Mississippi, Cartier to Canada, and a host of Portuguese adventurers by the southern sea to Hindostan.

And thus did all the civilized nations enter almost simultaneously upon a career of discovery—not only by the western ocean, across which the great pilot of Genoa had led the way, but by the South and East and North as well; until, pressing on and on, they meet at length from opposite directions, and thus prove the world is round.

"In olden times the mind of man was chained;"

but now the barriers raised by ignorance, prejudice, and superstition fall to pieces, and to wondering ears an Italian poet sings this strange song:

"Deep beneath our feet are other towns
And powerful realms, till now undreamt of ;
And Hercules will look around and blush,
To see how far the bounds in vain he set ;"

and surely he must have been much astonished when he looked about him and saw

"How far his Pillars high, in vain, were placed."

There was, indeed, no more an end to the adventurous spirit which now possessed the world than there was to the world itself, and the whole earth became an easy conquest when Magellan found at last the strait which he had sought, and first marked with vessel's keel a track around the globe.

Thus did the tide roll on, until "the whole vast theatre of the earth, with some partial shades, was opened to the gaze of science."

Into one of these partial shades you and I, gentlemen, have, each in our way, been peering, with the hope that we would see the curtain rise and let the light of science in upon that dark region around the North Pole, toward which we have all been drawn from childhood by the ever-powerful charm of the unknown.

To that mysterious region the late Dr. Kane left us the legacy of a route. Encouraged by your support, he was enabled to indicate a plan by which, as it seemed, could be solved some of the most interesting of the remaining problems of geography—problems which have occupied the minds of thinking men since the bold Pytheas first glided to the western ocean between the Pillars of Hercules—problems which have been overclouded with myths since the Hellenic poets first made the Hyperborea of their fancy inaccessible by land or sea, and peopled it with beings who were exempt from disease and old age, from toils and warfare and death.

One of these problems is that of the open Polar Sea.

The gallant efforts of Burton, Speke, and Baker have shown us the sources of the Nile, but the open Polar Sea remains among the few great geographical questions yet unanswered—unanswered I mean, however, only in the sense of its actual navigation.

Aiming to follow in the footsteps of my former commander, I had the honor, eleven years ago, to bring to your notice the scheme of a voyage for the accomplishment of that much desired end. It is eight years and a-half since the voyage was begun, and seven since it was ended.

This interval of seven years, so full of surprising changes in the civilized communities of the earth, so prolific in discoveries for the promotion of personal convenience and national power, has spread our geographical knowledge practically no nearer to the North Pole than formerly, although I would by no means disparage the recent gallant efforts of the Germans and Swedes, nor of the confirmation of the Polar Land brought by Captain Long from Behring Strait. Yet the same curtain whose web is wonder and whose woof is awe, still hangs over the region about the axis of the globe, and we are still as curious as ever to peer beneath it, and to write the final record on that great scroll which is the science that we love.

The history of Arctic discovery is an interesting study. It had its origin in the first period of modern intellectual growth. It is coeval with the discovery of America. It arose not from the love of science, but from a love of power; not from the love of discovery for its own sake, but in the hope that by the North the Indies might be reached—that land of so much promise—the Orient which the ancients knew, which Marco Polo and Sir John Mandeville had latterly described in language as quaint as it was exaggerated; to gain which kings sold their honor and queens pawned their jewels; the struggle for which filled the world with wars and bloodshed, and converted it into a pandemonium of jealousy and strife; to reach which was to reach a land ruled by princes throned in gold and silver, breathing an atmosphere perfumed with sweet spices, and where gems were plentiful as the dewdrops that sparkle in the morning sun.

Thus had the Kublai Khan of Polo's narrative become celebrated, thus had his riches been magnified, and thus did the half savage ruler of the Tartar tribes become the central pivot around which were to revolve the hopes of Christendom.

Then India and America were one. Columbus died in that belief—in the belief that he had touched the Khan's great territories.

I have before me a copy of the map of the French geographer Orontius Fines, of 1531, "cut out in the fourme of a harte," as quaintly described by Richard Willes. The possession of this rare treasure I owe to my very kind friend Mr. J. Carson Brevoort, whom we all know as one of our most accomplished geographers. The unity of the Continents is there shown, and the text of Willes gives this sweeping description of what was the "conclusion in the scholes,"—"The West Indyces were a parte of Asie. *Quid-*

quid præter Africam et Europam est, Asia est. Whatsoever land doeth neyther appertayne unto Afrike nor to Europe, is parte of Asie."

The "sea carde" of Moletius and the "globes" of Mercator, spoken of by Willes, exhibit the same unity of the continents, and they even extend "the West Indishe lande even to the North Pole, and consequently all passage by sea is cut off that way." The south end of Greenland Moletius "maketh firme lande with America, the north parte continent with Lapon-lande and Norway." Subsequently Moletius and Mercator "opened a goulph betwvxt the West Indies and the extreme northerne lande;" but Willes was none the more convinced that a passage was to be found in that direction. "Well," he exclaims, "graunt the West Indies not to continue continent unto the Pole; graunt there be a passage betwvxt the two lands; let the goulph lye nearer us than commonly in cardes we fynde it set, namely, betwvxt the 61 and 64 degrees north, as *Gemma Frisius* in his mappes and globes imagineth it, and so left by our countriman *Sebastian Cabote* in his table, * * * yet doeth it not folowe that we have free passage to *Cathayo*;" and after citing as an illustration the closed Mediterranean Sea, and the fact that the narrow isthmus of Suez blocked the passage from Alexandria to the Moluccas, he thus concludes: "In lyke maner, although the northern passage be free at 61 degrees latitude, and the west ocean beyonde America, usually called *Mar del Zur*, known to be open at 40 degrees elevation, say the Lande *Giapan*, yea 300 leagues northerly above *Giapan*, yet may there be lande to hynder the through passage that way by sea, as in the example aforesayde it falleth out, *Asia* and *America* being there joined together in one continent."

Thus wrote Willes in 1576, when Martin Frobisher was contemplating his first voyage for the discovery of a north-west passage to Cathay, and the accomplishment of the only thing left undone in the world "by which a notable mind might be made famous and fortunate."

But there is much earlier date than that assigned by Willes for the union of Europe and America, and thus, for the connection, at the remote north, of *all* the lands of the northern hemisphere. Europe and America are thus joined on the map of Ziegler, published in 1532. Ziegler's information was no doubt obtained from the data of the brothers Zeni, who, by their long residence on Friesland (Faroe Islands), in the thirteenth century, fully acquainted themselves with Norse geography. The publication of their

records was not, however, made by their descendants until 1558, twenty-six years subsequent to the publication of Ziegler's map, which represents Lapland and Greenland as joined by a coast line that sweeps northward in a great curve. This map is also the property of Mr. Brevoort, and to the same gentleman I am under obligations for a copy of the famous globe of Martin Behaim, drawn in 1492, which was no doubt founded on the same data used by the Italian astronomer Toscanelli, upon which Asia and Japan are marked down after the descriptions of Marco Polo. Here Japan lies in the middle of the sea between the eastern coast of Asia and the western coast of Europe—the sea being studded with islands that are all now familiar to us in fact or fable—the Azores, Antilia, St. Brandan's Isle, Cipango, and the main land of Cathay. Toscanelli and Columbus were personal friends, and it was upon Toscanelli's map, of which unhappily no copy is known to exist, that the great discoverer wrought out the scheme of his immortal voyage.

Upon the map of Orontius Fines, Mexico is placed, as a part of Asia, a little to the east of the river Ganges, and *west* of Cathay (China). The great Pacific Ocean was then unknown. Balboa had not waded into its placid waters; nor had Cortez and Pizarro despoiled the Aztecs and the Incas, and destroyed their kings, nor had they penetrated to the remotest confines of their dominions to look out upon another western water and dream of an Orient still beyond; nor had Magellan and Sebastian del Cano in their worm-eaten, storm-battered vessel, crossed De Gama's track, when John Cabot first set out upon the forty-sixth parallel of north latitude to reach by the north and west the paradise of earthly hopes and joys to which that adventurous age aspired.

Geographical ideas were as strangely confounded in those days as man's ambitions were misdirected. It was an age of fable. Fabulous islands rose in the sea, to sink away again as mysteriously; men of fabulous proportions and shapes were as plentiful as princes with fabulous wealth and splendor; fabulous beasts lived upon the land, fabulous monsters, large enough to destroy whole fleets, inhabited the sea; marvellous influences, powerful enough to draw a vessel's bolts, existed in the Arctic waters; and nothing was too strange or wonderful to be believed in that most credulous time.

The north was especially prolific in those monstrous productions of men's fancies, and the charts of the region are a striking illustration of the fertility of invention which then prevailed. They partook, however, only of the general superstition.

The world was then divided by an imaginary line, running north and south. This was the Pope's celebrated Bull of partition, which split the world like an apple, and with as little trouble. The line ran through the Cape de Verdes, and all new lands that lay to the eastward belonged to Portugal, and all new lands that lay to the westward belonged to Spain.

This was the largest business in the territorial way ever done, and these two peoples, with each a hemisphere for their portion, went forth with the cross in the one hand and the sword in the other, to convert the infidel or to destroy him—in any case to possess his lands. This they called "The pacification of the Indies." The Indian, as every new race of men was then called, had no rights which those fearless, enterprising, and mighty "*Pacificadores*" as they styled themselves, *Conquistadores* as they were in fact, were bound to respect.

When the Pacific Ocean became known, it was discovered that the Pope's Bull had given to the Portuguese Asia, and to the Spaniards America.

Then came the new cry of the South Sea.

The Spaniards and the Portuguese had steadily encroached upon each other's territories. But now other peoples, jealous of the wealth and power which had poured into the little European Peninsula from the opposite ends of the earth, entered the field as rivals for the spoils.

Heedless of the Pope's Bull, and thinking, as the King of France well put it, that it was "something strange the Lord should have forgotten them all in his will," the English, Dutch, and French set up a shout, rather feeble it is true at first, and perhaps a little experimental, but still a shout. To the South Sea, to the South Sea. To India, to Japan, to the Moluccas. To Cathayo. To the East, to the East. Here was their Mecca.

But how was this hope to be accomplished? By this time the American barrier was pretty well defined, and as a barrier to the South Sea was fully recognized. Besides, these Castilian knights had possession of it, and had the power to make their claims respected.

I will not tax your patience with the repetition of so familiar a theme as the multitude of voyages along the eastern coast of America, before the true nature of the coast was determined; before it was discovered that no passage to the South Sea existed by any of the great openings between the St. Lawrence and the Rio de la Plata—none, indeed, until the vast continent should be fairly rounded in the cold regions of the north and south into which it projected.

The Portuguese, who enjoyed their half of the world, and

were growing rich upon it, affected to believe that there was no route to the East,—no passage into the South Sea, except by the Cape of Good Hope, and that America touched the poles. It was a very comfortable belief, but the Spaniards under Magellan disproved the assertion, and the South Sea was opened by the West.

But this did not help the English, French, and Dutch. They saw little chance of rivalling these determined people who had divided the world between them, and for a while, unable to disturb them otherwise, they chose the part of freebooters of the sea, and satisfied themselves with waylaying the richly laden *galleons* of their enemies.

But they were not long content with such uncertain booty. In the general scramble for the possession of the world they must have lands for themselves, and a *route* to India for themselves; and since that to the South was barred by the Spaniard, they sought it in the North. To find this passage became the settled resolution of the northern nations, and the history of this undertaking is the history of Arctic discovery.

In the reign of Francis I. Jaques Cartier entered the St. Lawrence, and returned to report that there *was* a northern Magellan's Strait, and that he had found it. He was rewarded by his king much after the manner Columbus and Cortez had been rewarded before him. But, unlike those two heroes, he had the satisfaction of disappointing an ungrateful master by personally proving the fallacy of his own conjectures.

A new era dawned when Queen Elizabeth came to the British throne, and built up "the wooden walls of England," sending forth her captains to do what they might, encouraging them alike in success and in defeat. With this great monarch the true conquest of America began—not of its people only, and of the riches gathered from the mines, but from the soil—a conquest which planted the seeds of a nation whose growth has been unparalleled in the history of the world, and whose future influence over the destinies of the human race is even now beyond conjecture.

The British adventurer carried with him everywhere enthusiasm for his queen. Remembering the hearty shake she gave his knotty hand at parting; remembering the brimming cup she drained to him on the deck of his own ship; remembering the Godspeed that was wafted after him from her waving handkerchief as he glided down the Thames, he went forth to do his best, and never before nor since was sovereign served as she was served.

It does not concern our present theme to recall the deeds of Elizabeth's great favorites—her Hawkins, her Raleighs, her Drakes, her Frobishers, her Gilberts; I would merely indicate the manner in which the scheme for reaching the Indies by the North was first inaugurated—a scheme which, actually beginning in 1497 with the Venetian Cabot, under the British flag, first becoming an important question, as we have seen, in the time of the maiden queen, was never brought to an end until McClure, under the same flag, at so late a date as 1853, after an interval of three hundred and fifty-six years, proved at length that there was in truth a northern route into the Pacific and to the Indies—a “northern Magellan's Strait” at last; but proving at the same time that the route which he had found was not available for commercial purposes.

How wonderful the changes which have taken place during that time in men's conceptions respecting the regions about the North Pole of the earth! In Cabot's day the North Pole was thought by many to be a huge rock pointing to the Pole star, and bathed by the waters of an open sea. This was, I think, first shown on the “*Universalior cogniti Orbis Tabula*” of Ruysch (which I have from the Society's most excellent and rapidly-increasing library of rare works), embraced in a collection of the maps of Ptolemy revised by Marco Beneventano, and published at Rome in 1508. Ruysch's plan of the North was subsequently modified by Orontius Fines, on his heart-shaped map, to which I have previously alluded; but, on both maps, at the four quarters there were four vast islands, between which flowed four great rivers, and these rivers drained the superfluous waters of the ocean into a great basin about the Pole, whence they plunged wildly down into the innermost abysses of the earth. These four islands were fertile, and possessed a salubrious climate, and at least one of them was inhabited by a race of pigmies, who, descending sometimes to southerly latitudes, created an infinite deal of mischief. On the maps of the time of Charles V., these four islands and four rivers are marked down with great exactness by the highly imaginative cosmographer of that celebrated monarch.

About the year 1588 these picturesque conjectures were somewhat disturbed by the appearance of one Lorenzo Maldonado, who, having got into the Pacific Ocean, claimed to have entered from that side the fabulous “Straits of Anian.” This strait was first suggested on the globe of Schöner,

and was founded, no doubt, upon a faulty reading of the name *Mar Usiano*, which bounded the New World on the North, as shown with much exactness in the Ptolemy of 1513. It was more elaborately drawn afterwards by Moletius and Mercator, and was soon firmly believed in; and therefore Maldonado was readily credited when he declared that he had sailed all the way through the strait to the Atlantic Ocean. He forthwith proceeded to offer his information for sale to the English; but when the eager purchaser came forward ready to exchange the pay for the pilot, the pilot had disappeared, having discovered that he must first lead the way.

The same fortune befell the Greek De Fuca, a few years later. Sailing up the coast of California, De Fuca, then in the service of Spain, discovered the coast to trend suddenly to the eastward, and upon his return he offered the information in the same quarter as Maldonado had done before; but the wary Englishman had no mind to purchase the prize before he had it in his keeping. So the disappointed adventurer went to Mexico and died.

A friar of considerable celebrity at that time, on account of his travels, by name Andreas Urdaneta, was reported to have accomplished this great journey between the oceans, in a ship; but he does not appear to have profited by it more than the others. I mention these incidents merely to show how deeply the public mind was occupied with that quarter of the world.

Throwing aside these fabulous accounts, let us now review the actual field of discovery. In order to do this with the least loss of time, I will reverse the course which I have hitherto pursued; that is to say, I will temporarily skip over a period of three hundred years, and briefly illustrate the present state of Arctic geography.

The diagram on the wall (drawn after the recent and most excellent chart of Dr. Heinrich Kiepert) represents the Arctic regions in circumpolar projection. It exhibits a broad ocean about the North Pole—an ocean, however, without the islands and the rivers and the tumbling waters of the inventive Frenchman.

This ocean covers an area of nearly four millions of square miles, almost equal in extent to the whole continent of North America. It is closely invested by land throughout the greater part of its extensive circuit, and it forms one of the great Basins of the earth. Into it pour the waters of the river sheds of Northern Asia and America, among the largest

in the world—the former equalling 3,500,000, the latter 800,000 square miles. Its currents are a part of the great system of ocean currents in which the restless waters of the globe are ever moving, and through this agency and that of the discharging rivers, the region about the Pole is tempered with a warmth not otherwise natural to it, while in the same proportion the chilled waters, returning to the South, soften the equatorial heat; and in this we behold a sublime illustration of Nature's wise and beneficent law of compensation.

It will not be amiss for us here to pause a few moments that we may trace these currents so far as known, and I will ask you again to follow me around the globe, that we may get the key to our position—not, however, this time in the track of the Spaniard, but in the track of Nature, whose ways are always ways of pleasantness, if her paths, when one is pursuing them, are not always paths of peace.

And let me say here, that I do not offer an apology for the elementary nature of my observations, for I have not assumed to read a paper descriptive of new discoveries, nor to give any elaborate discussion of scientific principles, but to present a new grouping of well-known events and recorded facts.

Let us then start in the Indian Ocean. Here, in the neighborhood of Borneo, in the zone of the "Southeast Trades," in the region of the monsoons and hurricanes, we find the great body of the waters of the ocean having a westerly flow. This flow is interrupted by the coast of Africa, which deflects a portion northward, but sends the main current southward through the Mozambique channel. Reaching the Cape of Good Hope, it enters the Atlantic as the Cape Current, whence it follows the general direction of the west coast of Africa, until it assumes again a westward course as the great Equatorial Current of the Atlantic. Splitting now on the east coast of America, a part of it enters the Caribbean Sea and Gulf of Mexico, and originates the Gulf Stream. The other part, as before seen on the east coast of Africa, is carried south and west, and around Cape Horn it joins the Antarctic drift, and once more becomes the great Equatorial Current in the Pacific Ocean. Meeting Asia, the Japanese Current is deflected northward, and the main body of the stream, flowing on westward through the Molucca Sea, passes Borneo into the Indian Ocean, whence we first set out to trace the flow of waters—a flow which, varying in velocity from five to one hundred and twenty miles in four and twenty hours, would, in two years and ten months, carry a

dismasted ship or other floating object, uninfluenced by the winds, once around the globe.

Two points of this great artery of the ocean concern our present discussion; these are the Gulf Stream and the Japanese Current, which, breaking away from it and the tropic heat, plunge at length beneath the ice canopy of the Arctic seas, and are lost to observation in the unknown region round the Pole.

To a certain point we can, however, trace them with certainty.

The Gulf Stream—the great current of the North Atlantic—follows the east coast of North America until it meets the cold current from the north, where it is pressed out into the middle of the North Atlantic Basin, and in mid ocean sends off a branch to the Azores. Continuing thence northward beyond the latitude of Iceland, it touches Norway, and enters the Polar Sea.

The Japanese Current pursues the same course in the North Pacific. Throwing off a branch below the Aleutian Islands (which flowing southward tempers the climate of Sitka and Oregon), it continues northward through Behring's Strait, and like the Gulf Stream of the North Atlantic, enters the Polar Sea, and is lost among the ice.

Of the flow of the waters within the limits of that Polar Sea we know comparatively little. We trace, however, one great current outward from its unexplored depths. This sweeps along both coasts of Greenland, the branch on the eastern side, after touching Iceland, wheels around Cape Farewell into Baffin Bay, where it joins the other branch that sets through Smith Sound, and out from the great Parry Archipelago through Jones Sound, Lancaster Sound, and Hudson Strait. Thus uniting its various arms, this great Polar Current pursues its course, freighted with ice, along the coasts of Labrador and Newfoundland, wedges itself in between the Gulf Stream and the American coast, and is not finally lost until it has spread its benign influence over the neighborhood of the Gulf of Mexico, making habitable, regions which would otherwise be the hottest and most pestilential in the world.

Following the line of these two Currents, we observe a most remarkable difference in the conditions of the surface water. While the one is cold, and dotted with ice fields and icebergs, which drift sometimes as low as latitude 43° , the other is comparatively warm, even beyond the Arctic Circle, and but little ice is met until we have reached latitude 78° — 35° , or 2,100 nautical miles nearer the Pole than in the line of the Polar Current.

It is interesting to trace the parallel influences of the Gulf Stream and the Japanese Current upon the western coasts of Europe and America—tempering their climates to much the same degree on either side.

On the Atlantic side we find the flourishing city of Glasgow, in latitude $55^{\circ} 51'$, parallel with the most cold and desolate parts of Labrador, which is chilled by the ice incumbered current of Baffin Bay. The populous city of St. Petersburg is in the same parallel with Cape Farewell, the southern point of Greenland, in latitude $59^{\circ} 56'$. The famous city of Elsinore is in latitude $56^{\circ} 02'$.

On the Pacific side we find Sitka, in latitude $57^{\circ} 03'$, with a similar climate to that of the European cities before mentioned; or rather we might say with the winter of St. Petersburg and the summer of Padua.

Thus does the Gulf Stream, freighted with tropic warmth, carry a soft and pleasant climate to the British Isles and the lands bordering the Baltic Sea, and even to the coast of Norway, while the Polar Current of the other side of the Atlantic Ocean, freighted with ice, brings to the lands in the same latitude (those of lower Greenland and Labrador) chilling frosts and a climate that is endured only by a few hardy fishermen and fur-clad savages, who draw no subsistence from the soil. So great, indeed, is the influence of this Polar Current upon the one shore of the Atlantic and of the Gulf Stream upon the other, that before we have found on the eastern slope of the Alleghanies a climate as temperate as that of Elsinore, we have descended from the north almost to New York, which is in latitude $40^{\circ} 43'$.

These facts are of course not new, but it is well to refresh them in our minds, for they have not only an important bearing upon the value of our recent acquisition of Alaska, but are directly connected with the subject which we are at present considering.

It would almost seem certain, from a casual observation of these physical conditions, that the line of the Gulf Stream should be the most feasible route to the North Pole, and yet experience proves the ice barrier to be more impacted there than in any other quarter.

For a time it was indeed more favorably regarded than the route by the northwest. In this direction lay the "*Cape Tabin*" of Pliny—the northern Cape of Asia—the northern Cape of Good Hope; and here it was thought must surely lie the northern Magellan Strait. But the disastrous voyage of Willoughby caused the English to abandon the

effort to penetrate in that quarter, and the Dutch who succeeded them, in the unhappy death of Barentz, and the destruction of his ship, lost the bright hopes with which they had assumed the undertaking.

On the other hand, the sea immediately to the west of Spitzbergen became a general favorite. Here they would find the Strait. Here they penetrated to higher latitudes than in any other quarter. Here sailed many of the most noted mariners of their time, confident of finding the passage. Here Hudson reached to latitude $80^{\circ} 30'$, and Scoresby to $81^{\circ} 30'$. Here Phipps, Clavering, Sabine, and Buchan, and Franklin, have gone and fought against hard fortune; and here Parry, with, as has been well said, "a daring unequalled in the history of personal adventure," boldly struck out upon the Polar Sea with boat-sledges: but the ice becoming loosened with the advancing season, he was carried south by the Polar current two miles a day faster than he was travelling north. He was then in latitude $82^{\circ} 45'$, nearer to the Pole than, according to any well-authenticated record, any one had reached before, although many whale fishers have declared that they have sailed on and on without meeting ice, even to the very Pole itself. One stated that he had sailed two degrees beyond it, as recorded by Daines Barrington, and another enterprising Amsterdam whaler declared that he had sailed twice around it.

This was, indeed, for a long time, and is in some measure even to the present day, one of the most important whaling and sealing grounds in the world. In the early part of the eighteenth century the whaling fleet numbered from three to five hundred sail. In like manner Baffin Bay became similarly noted, and thus was added another powerful motive to Arctic discovery, and to the daring whalemens we are indebted for much valuable information.

It was into the Spitzbergen Sea that the German and Swedish expeditions made their way during the past summer; but their fortune does not appear to have been materially different from that of their predecessors. The details of these spirited voyages have not yet reached us, and we await their last published reports with much interest. It would appear, however, from the preliminary report of Captain Koldewey, commanding the German expedition, that he made important explorations on the north side of Spitzbergen, and reached to latitude $81^{\circ} 05'$, longitude 16° east, finding heavy and impenetrable ice. I have not yet met with any official statement from Prof. Nordenskiöld, of the Swedish party.

The attempts which have been made to find a passage from the Pacific into the Atlantic by following the course of the Japanese Current, have been attended with the same fortune as those by the Gulf Stream; and even after Behring had discovered the strait which separates Asia and America, there was little known of the coast lines to the east and west of it until they were approached from the land; and it was therefore not until then that there was any rational conception of Arctic geography, or of what was really attempted when men sought to pass the northern capes of Asia and America, and find there the strait which was to lead to wealth and fortune.

Prior to the time of Behring, however, geographers had some vague knowledge of parts of the north coast of Asia. Here the audacious Cossacks, fighting their way through hostile tribes from the Ural to the Yenissei, to lay tribute on the refractory Samoiedes, finally came upon the ocean and disclosed the wealth of mammoth ivory in the "ice cliffs" of the Siberian coast. This was about the year 1610. Merchants and hunters following after them, the Lena was at length discovered, and finally the entire coast of northern Asia was explored, chiefly in the interests of commerce and trade, either by means of dog sledges over the ice in the early spring, or in boats during the summer along the land lead caused by the melting of the ice in the floods of warm water which pour down into the Polar Sea from the watersheds of northern Asia.

In this direction it was that Baron Wrangell and Lieut. Anjou performed the most remarkable sledge journeys on record. The first named, by his published narrative, gave the first clear insight to the nature of northern Siberia, and to the Polar Sea beyond, and from this quarter were gathered, by this Arctic Hercules, golden fruits for science.

On the American side Hearne was the first to reach the sea. Following the Coppermine River he looked out upon the great Polar water in 1770, and opened the way for Mackenzie, Franklin, Richardson, Back, Rae, and others, whose explorations finally delineated the shore line from Behring Strait to the Atlantic.

The boundaries of the Polar basin were thus in a general way defined, thanks to the Cossacks and the gallant Hearne, who, following at the same time their own inclination and the river's course, opened to view extensive regions, habitable by man and useful to commerce.

If to Hearne we owe our first glimpse of Arctic America, to another gallant man we owe the chance which gave it to us,

for to him is the world indebted for the record of Hearne's heroic journey. This record was in the shape of a report in journal form to the Hudson's Bay Company, of which Hearne was an officer, and to a "pigeon hole" (where in all countries many good things go along with many bad) at headquarters, called Fort York, it was consigned, and there it lay for many years. The fortunes of war found the famous and chivalric French Admiral La Perouse in Hudson's Bay, and Fort York was one of his bloodless captures. La Perouse was a scholar and a gentleman. He ransacked the governor's papers, and found Hearne's journal. He read it, was charmed with it, and forthwith he told the powerless officer who had hauled down the cross of St. George before the Oriflamme, that if he would pledge his word and honor as a man to have poor Hearne put in print, he might have flag, fort, and all back again into his keeping. Such easy terms were never before accorded by conqueror to conquered, and the astonished British Governor, glad to be rid of the French Admiral on any terms, without further loss of time subscribed the conditions, and Hearne became immortal.

Such at least is the story as we have it on the word of Albert Gallatin.

The Arctic coast lines of Asia and America being once determined, the interest became centered in the two great groups of islands lying north of the continents. The one belonged to Russia, the other to England. The former soon explored the New Siberian group, but they failed to reach the traditional "Polar Land" beyond. They were invariably arrested by an open sea, as described by Baron Wrangell, "il-limitable to human vision." This open water extended in a southerly and easterly direction towards Behring Strait.

But the greater interest was felt in the English quarter—in the region where Arctic discovery first began—in the northwest. Here was made the first zealous search for the northern strait, and here were lives hazarded without number, and here, if a commercial route was not finally discovered to the Indies, the northern half of a continent was at least reclaimed to civilization.

Going back to a period anterior to the time of Columbus, we find the Northmen in possession of Iceland and Greenland, and they had clearly touched the American continent early in the eleventh century. How far they penetrated, or how long they occupied the country—what was their "Markland," and what their "Vineland," are questions, Mr. President, of which I will not attempt the discussion in the pres-

ence of one who has devoted so much attention to the subject as yourself, and who is so much more competent than I am to enlighten the Society.

Nor is it needful for me to dwell upon the vague and uncertain conjectures respecting the "St. Brandan's Isle" of the roving Irish monk. Was it the "*Terra Nova*" of the Cabots—the Newfoundland of the present day? Nor will I detain you with any discussion of the various conjectures respecting the progress, in the same direction, of the Basque fishermen. Whence they went, and by what course, no one knew but themselves, and since interest is always a safe lock upon a secret, they kept theirs well. Long before the world was popularly considered to be round, long before Columbus was born, this hardy race of men brought "*bacallaos*," that is, *stock* or *stick* fish, from some mysterious place in the West. Was their "*Terra de Bacallaos*," the "*la Terre de Morues*" (the land of codfish), the "*Kabeljauland*" of Cabot's day; the land which, at a later time, rich in wealth gathered from the sea, enticed Europeans to America, and opened the way to the discovery and occupation of Canada?

Nor need we linger over the discovery and the mysterious disappearance of *Friesland*, nor of the voyage of the *Cortereals* to Labrador, of Davis to the great strait which he discovered, of Baffin to the great bay beyond, which he circumnavigated; nor of the romantic hopes of the King of France when Cartier had reached "*La Grande Baie*" and the "*Ile de Bacchus*;" nor of the equally romantic project of the "Sovereign of the Seas," when her favorite Fro-bisher brought home his story of the "*Meta Incognita*," where was the turning cape at last, and on which she would forthwith plant a fort to protect the now certainly discovered strait leading to the Indies, from the use and occupation of all her enemies and rivals whatsoever.

But I would invite your attention for a few moments to events of a later period, within our own time and century; to the voyage of Ross, which proved Lancaster Sound to be crossed by the "Croker Mountains;" to the voyage of young Parry, who proved the Croker Mountains to be another Arctic fable, and who sailed into the middle of the great archipelago, half way through to Behring Strait; to the voyage of Franklin, which, performed in the two ships, *Erebus* and *Terror*, came so near accomplishing the northwest passage before the evil-omened vessels and their captain and their crews were sent by the Arctic frosts to death and immortality. And I would refresh in your minds, also, the memory of the great

developments in Arctic geography made by the men who have gone in search of this last of the expeditions for the discovery of the northern Magellan's Strait—of men who, by their conduct in that chivalric enterprise, have made their names familiar to our ears; of Collinson, who entering from Behring Strait, almost met the track of Franklin from the east; of McClure, who finally made the passage; of Austin; of Kellett of the *Resolute*; of Inglefield, who was the first to enter Smith Sound; of Kane, who, following upon his track, reached the open sea; of Sherard Osborn, who has written so charmingly of Arctic scenery and adventure; of chivalric Bellot; of scientific Sutherland; of our own sturdy De Haven; of Ommanney and Anderson; of McDougall and Mecham and Pim and Richards; of Hall, who had brought the last developments of Franklin's fate, and of others equally conspicuous, by whose united efforts an extensive region has been opened to science. The great group of islands lying north of America has been mainly explored, and at a later period I had the good fortune to trace the land still further northward—nearly to latitude 83° , until, like the Kotelnoi of Wrangell, it was shown to project into the Polar Sea itself.

This land is the most northern land at present known, and I hazard the opinion that it is, as Dr. Petermann has styled it in his elaborate paper in the January number of the *Geographische Mittheilungen* for 1867, "*Das nördlichste land der Erde.*" First discovered by me in 1854, in the expedition of Doctor Kane, it was then named, and is now known as Grinnell Land. Subsequently I revisited it in 1861, and then, during a long and laborious sledge journey (a journey of not less than 1,300 miles, performed on foot, with dogs to drag our stores on sledges, over the ice of Smith Sound, and prolonged through sixty days, with temperatures sometimes as low as 60° and 68° below zero, and without other shelter than a snow-hut), I penetrated, as it were, into the very heart of the Polar Basin.

And here we have reached the very point of all Arctic questions—the open Polar Sea.

And here rests Arctic discovery. Here ends the romantic record of three and a half centuries. That immense region around the North Pole, over which we have gone in this hasty flight, coming first into view in an ambitious age, has been gradually unfolded through the efforts of men acting mainly, as we have seen, in the interests of commerce. But commerce has at length abandoned the fight for a track across the globe. She sees no new fields or products to

grasp in that direction, and patient Science sits upon her neglected seat, and is left to do alone what yet remains. She has done much in her own quiet way already, and she will yet do all. And there is yet much to be accomplished.

I have spoken of the open Polar Sea—as a fact and as a fable—as it was pictured several centuries ago, and as it is known at the present time. The fable need not be disproved; nor need the fact be proved. It is established. The observations are conclusive, and they are so generally familiar that I have not thought it necessary to detain you with a discussion of them. That such an extensive area of water should be frozen would appear to be impossible, even without other evidence than an ordinary acquaintance with the phenomena of nature. Water is a restless object. Lightsome and limpid, it treads the earth or mounts to heaven, and its natural state is one of incessant change. When the evening shades are coming on it leaves the floating air and nestles through the night upon the gladdened leaf; with the early flush of morning it melts away upon the first returning sunbeam, or steals to earth and seeks the fountain and the brook; and when the winter frosts threaten it, then it flees before the danger in the rivulet and rolling wave.

Firmly frozen bodies of water of any considerable extent are not known. Baffin Bay is never closed; Hudson Bay is as open at its centre in midwinter as in July; the coast of Siberia is lined with a narrow belt, while all beyond is open; and even Baffin Bay in its upper part, which, as the "North Water," may be regarded almost as a separate sea, is never closely sealed: there is much drift ice in the summer, though little fixed ice in the winter. Upon its margin I passed the winter of 1860–61, and there, even at forty degrees below zero, we were always within the sound of the beating surf. So persistently, indeed, did this water refuse to close up, that, until the darkness of the winter had passed away and March had come with the sunlight and the greatest cold of all the year (68° below zero), we were kept close prisoners within the bay where we were harbored—the troubled waves breaking incessantly upon the capes on either side.

The waters of the Arctic Ocean, moving continually in currents from south to north, and from north to south, are kept at a general temperature above the freezing point, and the ice forms only where the waters are sheltered by the land, and are not in motion; and it is a fact worthy to be borne in mind, that the deep sea water preserves throughout the world an almost uniform temperature, little removed from 40° Fah-

renheit's scale, while the surface water partakes more or less of the temperature of the air. That is, while in the tropical regions the surface water has often a temperature as high as 88° , in the Polar regions it is usually at the freezing point of sea water, 28.75° , seldom rising much above that degree.

It follows, therefore, that the general reduction of temperature of the air as we approach the North Pole is disturbed by local causes. The system of isotherms, first projected by Baron Humboldt to the thirty-second degree, show a wide deflection towards the Pole in the line of the Gulf Stream and the Japanese Current, thus indicating that within the northern hemisphere there are two great centres or Poles of cold, nearly equidistant from the geographical Pole. One of these Poles of cold is about the great group of islands to the north of America, among which the ice is gathered, thus keeping the warmer water from contact with the air; the other is about the new Siberian group above Siberia. Towards this milder region about the Pole—milder because of the open water that is continually there—the water fowl take their flight in the breeding season, and in the same direction the whales migrate in search of fresh feeding grounds.

Keeping the eye upon the coast line which invests this great Arctic Basin, we trace with it an ice belt along the coast of Siberia to Nova Zembla, from Nova Zembla to Spitzbergen, from Spitzbergen to Greenland, from Greenland to and among the islands north of the American continent, thence along the American coast and across Behring Strait back again to Siberia—a continuous land clinging belt within which lies the open sea—that myth of ignorance and wonder of wise men, the sea of fable and of fabled story, against whose barrier all the ingenuity and arts of man have not prevailed. The beasts of the sea and the fowls of the air seek it, safe there from man's pursuit; and, to this time, useless for all man's purposes, its tumbling waves beat and break against the ice-girt shore in undisturbed seclusion now as when "the morning stars first sang together, and all the sons of God shouted for joy."

Great wondrous sea ! till now thy broad waters blue
No man made keel of ship ere yet has plowed ;
Ice-ribbed and unapproachable art thou,
Heedless of all the threats that man has vowed
To break thy barriers down. And he has bowed
Before thy prowess. Fearful of thy fame,
Backward hurled, he hears thy triumph loud
Proclaimed, and owns his efforts weak and tame
Compared with e'en thy feeblest terrors, that his proud ships doth maim.

Along thy adamantine walls are piled
His wrecks, like ghostly sentinels, to say,—
“Thus far, no farther! By these waters wild
There is no traffic for the world. A way
Cannot be found where'er this sea doth sway
The fate of empires, in their commerce free.
By north, by east, by west, by every way
The path is closed, and here we lie.” Great sea!
We hear thy shout of triumph on the frozen wall:—“Victory!”

Shall the victory remain with the sea, or shall it remain with us? Shall we not make one more effort to plant over it the standard of our science, to wave over it the flag of our country? Shall we not woo once more this Penelope of Oceans? The time is favorable. The sea is not less formidable, it is true, nor yet less fickle than it has ever been before, but we have learned much by experience, and I am fully persuaded that these Polar waters may be navigated.

To that end, as you have seen, there are four routes. Without here entering into an elaborate discussion of the reason therefor, I give the preference to that by Smith Sound. My views are in this respect in no way changed, but rather they are confirmed by events. I give this simple enumeration of its advantages:

1. Land as a base of operation.
2. The opportunity to colonize a party of hunters and natives as a permanent support.

A glance at the map will show you how important is the first of these elements. The second requires a further explanation:

The colony was, indeed, the key to the plan which I had proposed for 1862. Had I been able to return that year, I would have started with two vessels, one a small steamer, the other a sailing vessel, as a store ship. Pushing through the “middle ice” of Baffin Bay, I would have steered for Port Foulke, my old winter harbor, at the mouth of Smith Sound. Here I would have secured the auxiliary vessel, and remaining only a sufficient time to see the natives gathered together, and the wheels of my little colony set in motion, I would have sought the west coast of Smith Sound with the steamer, and through the land leads have worked my way to the Polar water. Failing to accomplish this the first season, I would have secured a harbor for the winter, and pushed on the work as opportunity offered. Failing altogether (in the event of finding the ice too closely impacted at the head of Smith Sound to admit of a passage), I would still have secured my object, for with a provision depot now within six hundred

nautical miles of the Pole, with the colony at my back, and in the winter readily accessible, with dogs breeding there, furs and provisions accumulating, I would have overcome the obstacles which embarrassed me in 1860-61, and which had embarrassed Dr. Kane before me. Once in this favorable situation, I would have brought up my available strength from the colony, and in the early spring have put out depots of provisions along the line of Grinnell Land, and following them up with a boat mounted on runners, I would then have sought the open water and the Pole.

Such was my plan seven years ago. It is my plan to-day. I believe it reasonable, and experience convinces me that it is practicable. I even believe that the chances are greatly in favor of the success of the first part of the scheme—that is to say, that the ice belt can be penetrated with the steamer, the open sea navigated, and Behring Strait and the Pacific Ocean reached.

The plan which I have thus sketched does not (with the single exception of the proposed colony) differ materially from the plan which I laid before you eleven years since. But the expedition with which I actually took the field, was by no means what my fancy had originally painted it.

Instead of the two vessels which were at first proposed, and one of which should be a steamer, I was forced to content myself with one small schooner, and to start without the much needed steam, the lack of which cost me the main purpose of the voyage, for I have no hesitation in saying that with a steam vessel I would certainly have reached the Polar water and the North Pole in September, 1860. But public opinion at that time was much opposed to the further risk of life in that much maligned region, and the few of us who stood together for the voyage at every hazard, in concert with our friends in Boston, Philadelphia, Washington, and Albany, had to own that we could do no more than fit out the little schooner; and therefore the expedition became like the German expedition of the past summer, in some sense, experimental. The advantages, however, which were gained by the experiment, were in a measure lost by the war which having broken out in my absence, prevented my return north in the spring of 1862, by claiming my services in a quarter which then occupied the hearts and hopes of every good citizen. I have not since been able to gather up what was then lost and scattered, and complete what I had begun.

You are aware, from reports which I have hitherto made to the Society, that we were unable to penetrate the Smith

Sound ice with our sails alone; but, as I have stated a few moments ago, with dog sledges over the ice in the spring, we reached the most northern land on the globe; and tracing it to a point of latitude beyond that of any previous exploration, we stood upon the shores of the open sea which we overlooked, and we set up our flag and cairn only five hundred miles from the North Pole. The position was one, therefore, valuable for observation, and my conclusions are founded upon what I have seen and experienced. These as I have said lead me to prefer this route. But the others are certainly not without their peculiar attractions.

Next to the route by way of Smith Sound I should, in some respects, give the preference to the route by Behring Strait. Fitting out at San Francisco, and starting finally from our new territory of Alaska, I would enter the strait and steer north and west in the wake of the whales and whalers, who are always sure to know where to seek the open water.

But this route has neither of the advantages to recommend it that I have urged in favor of Smith Sound. The hitherto impenetrable ice-belt comes down lower there than at any point of the whole Arctic circuit, and there is not likely to be found any land that would serve as a base of operations for a continued and extended exploration. The Behring Strait route has the support of a distinguished name—that of General Thomas L. Kane, who ably set forth its advantages in his instructive paper on Alaska, which he read to us some months ago, and it is by this Behring Strait route that M. Lambert proposes to conduct the French expedition now, as I understand, vigorously preparing. It is also advocated by Captain Silas Bent, U. S. N., in the letter you have favored us with, Mr. President, in the opening address, to which we have all listened with so much pleasure and profit, not, however, unmixed with sadness at the announcement you have made of the death of one of the great lights of Geographical Science (M. de la Roquette).

Captain Bent formerly communicated to the Society some valuable observations respecting the Kuro-Siwo, or Japanese Current, of the North Pacific Ocean, and, independent of his abilities, his position as chief hydrographic officer to the expedition of the late Commodore Perry, entitle any opinions which he may express to high consideration.

On the opposite side of the Pole from Behring Strait, and ten degrees nearer to it, we find in the Spitzbergen Sea, much

the same conditions that exist above Behring Strait. The eminent geographer Dr. Petermann is, I believe, now refitting his expedition with two steamers to return by that route to the ground it occupied the past summer; and since there is no nationality in science, we can certainly all unite in wishing him the success he so ardently desires, and to the attainment of which he has devoted so much time and energy. But it seems to me that the grounds upon which he bases his expectations are somewhat arbitrary. He projects Greenland entirely across the Arctic Ocean, and he puts Captain Inglefield, Dr. Kane, and myself in a *cul-de-sac*, quite regardless of our reports that there is a strong current setting south through Smith Sound, and that open water makes from the north, as I have personally observed—neither of which events could possibly happen did not Smith Sound lead into the Polar Ocean. So rapidly indeed was the open water making from the north in May, 1861, between latitudes 81° and 82° , that I was forced to the land, and escaped with my party, not without having encountered serious risk.

Much has been said of the fourth route—that to the east of Spitzbergen—between Spitzbergen and Nova Zembla. But to my mind this is the least favorable of them all, independent of the failures which have resulted from following the current in that direction, and of the probable fact that extensive lands, beginning with the unexplored Gillis Land, lie to the north and east. And this brings me once more to the discussion of the principle which must be kept in view in the conduct of this Polar enterprise, from whatever point it may be undertaken.

It is much a question of ocean currents. Follow the ocean currents has been often urged. Follow the Gulf Stream toward Nova Zembla, says one; follow the Japanese Current through Behring Strait and beyond says another. This looks reasonable on paper and sounds well, but the evidence is against it. The truth is, this is precisely what ought not to be done, and it is what never has been done successfully to any considerable extent, in the whole history of Arctic exploration. It is, indeed, by following precisely the opposite course that we must look for success.

The closest approaches to the Poles by water have been by way of Spitzbergen. Here the polar current comes from the north and east, and Spitzbergen gives a lee along which vessels can make their way almost any year as far as latitude 80° .

In like manner the Polar Land to the north and west of

Behring Strait furnishes a similar lee, for there the current is from the north and west. There are thus many points of resemblance. Both present deep breaks in the ice-belt; both are favorite whaling grounds; in both the whales are seen to go north; in both whales have been caught with harpoons in them which they had carried from the opposite side of the Pole; into both have whale-ships gone until they could see no ice—until they were sailing into an open sea—in the one to 81° or 82° , in the other to 72° and 73° , or perhaps even further. In the latter quarter the Massachusetts whaler of New Bedford, in July, 1866, sailed to $72^{\circ} 30'$. Her course was to the west of the Herald and Plover Islands. The Polar Land lay to the left as the vessel sailed northward, and was distinctly visible; and in this connection I will observe that this Polar Land is familiar to most of the whalers who go to that sea. Captain Long has become noted for sailing nearer to it than any of his predecessors. It would seem to be an extensive island.

In this same direction several Government expeditions have sought an entrance, but they were, with one exception, unable to penetrate beyond 72° . Here Cook was driven back at $70^{\circ} 43'$; Beechy at 71° ; Kellett and Moore at $72^{\circ} 51'$, seeing "water-sky" beyond, but impenetrable ice around them; and the same fortune befell the able and distinguished commander, Captain John Rodgers, of the U. S. Navy.

Here let me remark, also, that to the eastward from Behring Strait there exists much the same condition of things that exists in the sea towards Nova Zembla. In both cases the current sets to the north and east; in both cases is the ice closely impacted: in neither case is there the least chance of success. Collinson and McClure made their way eastward, it is true, in this direction, but it was by keeping below the ice-belt, through the leads which make in the summer there as along all Arctic lands.

And now let me assert one more dogma as part of the general proposition. A successful prosecution of this exploration must be in the direction against the current, and towards the point where the open water makes from the northward; where the land gives you holding ground; where the ice drifts past you; where hope lies ahead; where the enemy sets, not with you on your track, but behind you; where a field of ice when once passed is rid of.

Such a route we have in Smith Sound—once more land to give a lee (Grinnell Land); once more a southerly drift; once more open water making to the northward. I will

say no more, nor need I recite to you the advantages to science (more than in any other Arctic quarter) which would accrue from a prosecution of this line of discovery—the determination of the limits of this most northern land upon the globe, of the unexplored coasts of Greenland, of the great glaciers in that region; and, indeed, in almost every department of physical science, the Smith Sound colony would furnish the means for obtaining valuable materials. There is no locality like it along the boundaries of the unexplored Polar region, independent of all question as to its availability as a route to the Pole or to the Pacific Ocean.

As before stated, it was here that I passed the winter with my party in 1860–61, and subsisted them almost entirely by the hunt. Reindeer, foxes, seals, walrus, and in the summer birds, were very numerous, and we were never a single day without fresh food. Thus was the scurvy, so often incident to wintering in the Arctic regions, wholly avoided, and on board our little schooner *United States* there was never a “sick list” from the time of leaving home to our return.

I would establish my party again in the same situation as before, and then at Port Foulke I would build up the little colony. The natives are friendly, and could be made serviceable. Dogs could be reared to any extent, and the great numbers of walrus which might be captured with ease, would furnish them abundant subsistence. Annual communication could be had with home, and the products of the colony might indeed be made to bear no inconsiderable share of the expense of the exploration. This expense would not, however, be so great as is generally supposed. The two vessels furnished, they could be fully manned, the one with fifteen and the other with twenty-five persons, and maintained in the service during two and a half years for \$40,000: this would include provisions and wages, allowing the full navy ration, and the ordinary pay for officers and men of the merchant service.

I think I have stated enough to show the strength of footing upon which such an expedition would stand. There is no dislodging it. Founded upon the colony it may last for years. It is in a great measure self-sustaining. It will furnish a home for as many scientific explorers as wish to avail themselves of its advantages for years to come. It insures safety to the effort at the North towards the Polar Sea and North Pole in the event of disaster; and it insures that one disaster is not necessarily fatal, and does not necessitate the abandonment of the field and a return home, as was my own

case in 1860, and has been the case with every expedition that has gone before me during these past three hundred and seventy years.

I have said that I did not propose to advocate a cause, yet I cannot conclude without expressing a hope that the scheme which I have thus set forth may be carried out. I would wish to see it done under the American flag; I would wish to see that flag planted at the Pole before another country steps in to take from us the glory of priority—the prize for which we have striven. I would like to see the northern coasts of Greenland and Grinnell Land fully explored, and the boundaries of the great Polar Basin thus fully defined. We would all wish that there might no longer be a *mare incognita*, nor a *terra incognita* in that region of mysterious influences and mysterious climate—we would know the currents of the one and the character of the other, the magnetic forces, the temperatures and tides. I am no less earnest than formerly for the opportunity to conduct the expedition that would accomplish these results myself, and once more to try conclusions with my old foe the Smith Sound ice.

Our Government is not one upon which we usually rely in such emergencies; and yet I have thought the Government might now be persuaded into lending us a good, stout ship, of the many not in use. A noble little vessel with a noble history has been offered me by her public spirited owner, if I will bear the other part of the expense. This would be the very luxury of Arctic cruising—a craft under one's feet to be proud of, and whose gallant behavior on a memorable occasion, would of itself inspire confidence; but it would, as I know from former experience, be a rather expensive luxury for a personal enterprise, and the day has gone by when travellers pick up stray Incas, and squeeze golden ingots out of them by the room-full. The Arctic regions present no very conspicuous temptations of that sort, and for this reason no doubt it is, that the question as to the utility of these Arctic expeditions is often raised. The question is perhaps not unreasonable. But it is asked I think without due reflection. For he must be a bold man, who, with the history of discovery and invention before him, will now say, that any patient effort or honest work done anywhere, however obscure the result may be, is *useless*. "What good?" is a question often put, and had it been always heeded, Columbus would never have crossed the ocean, nor would Fulton have built a steamboat, nor would Morse have set up his telegraphic

poles; nor would we now profit by the patient labors of Newton and Watt and Volta; nor would the famous merchant princes of various times have stirred from the even tenor of their ways:—Berardi of Seville would not have sent his clerk Amerigo (with a name ready coined for a continent) to see what he could find in the yet unprofitable west; nor would La Maire have equipped, at his own expense, the expedition which was to fix his own name at the southern extremity of America; nor would Felix Booth have sent out Ross to gain for him America's most northern cape; nor would our own much honored merchant, Henry Grinnell, have sent his young friend Kane upon a service that was to result in the most northern land of all the earth being given to him as a monument forever.

In truth, the world has profited most by those discoveries and those enterprises which possessed at the outset only an abstract value, and had little interest to anybody except the learned and curious. "We cannot know what we have never tried." We cannot even yet assert that a ship may not be steered from the Atlantic to the Pacific Oceans by the Northern Sea; nor that our material interests are not directly concerned in reaching the North Pole of the earth.

But I plead the extension of our knowledge in that direction, solely because I plead for Science—fair and bright goddess, who with steadily increasing power has led men to fields of gain and usefulness by peaceful ways; who has her devotees and makes them useful—her Pizarros, her Cortez, her Magellans of a better time. She has upheld our Christian faith, and has made fruitful places for the Christian cross. With the traveller and the missionary she has been always present, smoothing their pathway, and opening the gates before their march—supporting them in adversity, consoling them in distress, counselling and instructing always. By the lonely watch fires of Livingston; by the weary couch of Baker; by the chilly bedside of Parry, on the Arctic snows; by the jungled shelter of Humboldt; by Du Chaillu's tent among the savage beasts and scarcelless savage men of the Ashango Land, she has been an ever faithful sentinel, as she has been an ever faithful guide to Xavier in the dangerous places of Japan, to Marquette among the wild Indians of the Illinois and Mississippi, to Huc among the Tartar tribes, to the Huguenot missionary on the banks of the Ogeechee, to the Quaker preacher in the sylvan lands of Penn.

But the hour warns me that I have too long taxed your

patience. On some future occasion it may be my privilege, gentlemen, to lay before you my plan of exploration more in detail. If it could so be brought about that the American Geographical Society should have the facilities placed at its disposal for taking in charge the final settlement of this great geographical question of the North, I as one of its members will be much rejoiced. It is here the interest properly centres. When the purposes of the Society become more widely known and more generally appreciated, as its facilities for obtaining and imparting information upon all questions relating to geography are fully understood by the citizens of New York, the road will be straight before us to what the Society may wish to do. Keeping on as it has done and is especially doing now, in these rooms which we owe to a citizen of rare public spirit (Mr. Peter Cooper), its wants and the public needs will be mutually recognized; and then, in this great mart of wealth and industry, the Society will be always able to command the means necessary to enterprises of the scope and character of that which I have named. Let us hope, at least, that they are not further beyond our reach than they are beyond our aspirations.

II.—*Communication from Captain SILAS BENT upon the routes to be pursued by expeditions to the North Pole.*

Communicated September 13, 1868.

2020 OLIVE STREET, ST. LOUIS, MO., Sept. 15, 1868.

Charles P. Daly, Esq., President of the American Geographical and Statistical Society :

SIR,—Having seen in the papers a short telegram that “England and Russia were about fitting out an expedition for the North Pole,” and having given the subject some reflection in past years—or rather having had the practicability of such an object forced upon my mind by circumstances—I take the liberty of addressing you as the presiding officer of that Society in this country which will naturally take the deepest interest in the plans adopted by the expedition in regard to the route it is to pursue, to state that the result of these reflections is the creation of a strong doubt in my mind as to whether former expeditions to the Arctic Seas have not pursued a mistaken route in attempting to go by the way of Baffin’s Bay, instead of by Behring’s Straits, or Spitzbergen.